National Institute of Environmental Health Sciences

Heat-related mortality in India: Excess all-cause mortality associated with the 2010 Ahmedabad heat wave

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Abstract:

Introduction: In the recent past, spells of extreme heat associated with appreciable mortality have been documented in developed countries, including North America and Europe. However, far fewer research reports are available from developing countries or specific cities in South Asia. In May 2010, Ahmedabad, India, faced a heat wave where the temperatures reached a high of 46.8°C with an apparent increase in mortality. The purpose of this study is to characterize the heat wave impact and assess the associated excess mortality. Methods: We conducted an analysis of all-cause mortality associated with a May 2010 heat wave in Ahmedabad, Gujarat, India, to determine whether extreme heat leads to excess mortality. Counts of all-cause deaths from May 1-31, 2010 were compared with the mean of counts from temporally matched periods in May 2009 and 2011 to calculate excess mortality. Other analyses included a 7-day moving average, mortality rate ratio analysis, and relationship between daily maximum temperature and daily all-cause death counts over the entire year of 2010, using month-wise correlations. Results: The May 2010 heat wave was associated with significant excess all-cause mortality. 4,462 all-cause deaths occurred, comprising an excess of 1,344 all-cause deaths, an estimated 43.1% increase when compared to the reference period (3,118 deaths). In monthly pair-wise comparisons for 2010, we found high correlations between mortality and daily maximum temperature during the locally hottest "summer" months of April (r Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.69, p

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: India

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified